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✓  
EMERGENCY RESPONSE TEAM  
FINAL SITE REVIEW/DETERMINATION FORM

(Submit Form to Vicky Tapang)

Date: 4-12-90

NPL Site?  
Yes ☒ No ☐

SUBJECT: Final Review/Determinaion regarding Site Referral

Site ID#: IDD081830994

Site Name: Monsanto Chemical Company

Location: Ada Springs, ID

Date received TAT  
Recommendations/Site Assessment: 1-5-90

Is TAT recommendations/site assessment attached? Yes ☒ No ☐

Date Completed Review: 4-12-90

Final Site Determination: NFA

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Signed: [Signature], OSC

cc: Site Assessment Team

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## ecology and environment, inc.

101 YESLER WAY, SEATTLE, WASHINGTON, 98104, TEL. 206/624-9537

International Specialists in the Environment

January 5, 1990

Carl G. Kitz  
Environmental Protection Agency  
1200 Sixth Avenue, HW-113  
Seattle, WA 98101

Ref: TDD T10-8905-009

Dear Carl:

Enclosed please find the Potential Hazardous Waste Site Identification Form and the trip report for Monsanto Chemical Company located in, Soda Springs, Idaho. The site evaluation was conducted to determine the necessity of a removal action.

One concern raised during the file review was the adequacy of the NPDES permit which requires that facility effluent discharge water be monitored for pH and temperature only.

Sincerely,


Richard W. Fullner  
TAT Leader

DRB/thl

Enclosure

☐ REMOVAL ACTION

☒ SITE ASSESSMENT

		POTENTIAL HAZARDOUS WASTE SITE SITE IDENTIFICATION		I. IDENTIFICATION	
				01 STATE ID	02 SITE NUMBER 0081830994
II. SITE NAME AND LOCATION					
01 SITE NAME (Legal, common, or descriptive name of site) Monsanto Chemical Company			02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER Soda Springs Plant		
03 CITY Soda Springs		04 STATE ID	05 ZIP CODE 83276	06 COUNTY Caribou	07 COUNTY CODE
09 DIRECTIONS TO SITE (Starting from nearest public road)  From Soda Springs, head west on State Highway 34 for approximately one mile. The Monsanto facility is on the west side of this highway.					
III. RESPONSIBLE PARTIES					
01 OWNER (If known) Monsanto Industrial Chemical Company			02 STREET (Business, residential, mailing) P.O. Box 816		
03 CITY Soda Springs		04 STATE ID	05 ZIP CODE 83276	06 TELEPHONE NUMBER 208, 547-3391	
07 OPERATOR (If known and different from owner) same			08 STREET (Business, residential, mailing)		
09 CITY		10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER ( )	
13 TYPE OF OWNERSHIP (Check one) <input checked="" type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL: _____ (Agency name) <input type="checkbox"/> C. STATE <input type="checkbox"/> D. COUNTY <input type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER: _____ (Specify) <input type="checkbox"/> G. UNKNOWN					
IV. HOW IDENTIFIED					
01 DATE IDENTIFIED ____/____/____ MONTH DAY YEAR		02 IDENTIFIED BY (Check all that apply) <input type="checkbox"/> A. CITIZEN COMPLAINT <input checked="" type="checkbox"/> B. INDUSTRY <input type="checkbox"/> C. STATE/LOCAL GOVERNMENT <input type="checkbox"/> D. AERIAL RECONNAISSANCE <input type="checkbox"/> E. RCRA INSPECTION <input type="checkbox"/> F. SURFACE IMPOUNDMENT ASSESSMENT <input type="checkbox"/> G. OTHER EPA IDENTIFICATION <input type="checkbox"/> H. OTHER _____ (Specify)			
V. SITE CHARACTERIZATION					
01 TYPE OF SITE (Check all that apply) <input type="checkbox"/> A. STORAGE <input type="checkbox"/> B. TREATMENT <input type="checkbox"/> C. DISPOSAL <input type="checkbox"/> D. UNAUTHORIZED DUMPING <input type="checkbox"/> E. OTHER _____ (Specify)					
02 SUMMARY OF KNOWN PROBLEMS (Provide narrative description)  Site investigations have revealed groundwater contamination in the immediate vicinity of the facility. Contamination including fluoride, cadmium, selenium, chloride, sulfate and vanadium, some of which are above MCL's, were detected in on-site monitoring wells.					
03 SUMMARY OF ALLEGED OR POTENTIAL PROBLEMS (Provide narrative description)  Naturally occurring radiological concentrations in phosphorus ore are concentrated in slag during processing of ore.					
VI. INFORMATION AVAILABLE FROM					
01 CONTACT William Longston		02 OF (Agency/Organization) U.S. Environmental Protection Agency		03 TELEPHONE NUMBER 206, 442-1196	
04 PREPARED BY David Byers		05 AGENCY TAT	06 ORGANIZATION Ecology & Enviro	07 TELEPHONE NUMBER 206, 624-9537	08 DATE 12 / 15 / 89 MONTH DAY YEAR



# ecology and environment, inc.

101 YESLER WAY, SEATTLE, WASHINGTON, 98104, TEL. 206/624-9537

International Specialists in the Environment

## TRIP REPORT

DATE: January 5, 1990

TO: Richard Fullner, TATL, E & E, Seattle

FROM: David Byers, Project Manager, E & E, Seattle **LRB**

SUBJ: Monsanto Chemical Company, Soda Springs, Idaho

REF: TDD: T10-8905-009

PAN: TID-0024-SAA

### Place Visited:

Monsanto Chemical Company  
Phosphorus production facility  
Soda Springs, Idaho

### Purpose of Trip:

The purpose of this site assessment was to determine the need for a removal action at the Monsanto Chemical Company's Soda Springs facility.

### Persons Conducting Investigation:

David Byers, TAT-Chemist  
John Roland, TAT-Geologist  
Ecology and Environment, Inc., Seattle, WA. (206) 624-9537

Wally Scarburgh  
U.S. EPA, Idaho Operation Office, Boise, Idaho (208) 334-1453

### Persons Contacted:

Robert Geddes  
Monsanto Industrial Chemical Company (Soda Springs Plant), Soda Springs,  
Idaho (208) 547-3391

Joan Ledger  
Idaho State Air Quality Bureau, Boise, Idaho (208) 334-5898

Date of On-site Visit:

October 3, 1989 (1100 to 1400)

**BACKGROUND**

On May 10, 1989, the Region X U.S. Environmental Protection Agency (EPA) Superfund Response and Investigations Section requested that the Ecology and Environment, Inc. (E & E) Technical Assistance Team (TAT) conduct a site assessment at the Monsanto Chemical Company's (Monsanto) phosphorus producing plant, located in Soda Springs, Idaho. The purpose of this site assessment was to determine the need for a removal action at this facility. This facility was proposed to the National Priorities List in May 1989 (Bennett 1989).

Overview of Site Operations

The Monsanto Chemical Company's Soda Springs, Idaho, plant is a 530-acre facility which produces elemental phosphorus. It has been in operation since 1952. The phosphorus is produced using electric arc furnaces and is shipped off site and used primarily in the manufacture of phosphoric acid, which is a feedstock for numerous commercial and industrial products.

Phosphate ore, mined from the nearby Henry Mine, is stockpiled on site. The ore is prepared for use in the furnaces by nodulizing in a rotary kiln. In the nodulization process, moisture and organics are removed, and the ore is agglomerated into stable nodules. The furnace feed consists of nodules, quartzite (silica rock) and coke. The coke and quartzite is dried, if necessary, prior to being fed into the furnace. Coke supplies the carbon which chemically reduces the phosphate ore to elemental phosphorus at the high temperatures generated by the furnaces. Silica is added to yield the proper composition and flow properties to the resulting slag. In addition, naturally occurring iron in the ore combines with the phosphorus to produce a smaller quantity of a slag-like material called ferrophosphorus.

The furnace gases, containing elemental phosphorus, carbon monoxide, and entrained dust from the furnace feed material, pass through a dust collector, which removes the particulates, then passes into a water spray condenser where the phosphorus is condensed into liquid form. The residual gas is primarily carbon monoxide which is re-routed into the kiln as a supplemental fuel.

The molten phosphorus is then settled to remove residual particulates and the sludge from this process is roasted to recover any remaining phosphorus. The elemental phosphorus is piped into rail tank cars for shipment and is always stored and transported under water to prevent exposure to oxygen which would result in a violent oxidation reaction.

## Waste Streams

Elemental phosphorus production at Monsanto involves numerous process streams, some of which are waste streams. Slag constitutes the greatest volume of waste at this facility. Molten slag (predominantly calcium silicate) is tapped from the base of the furnaces and poured onto piles to cool. The piles are approximately 130 feet in height and cover a large portion of the site. Extraction Procedure (EP) toxicity testing of this material indicated that EP toxicity criteria were not exceeded. The ferrophosphorus slag is cooled in separate piles and is later sold to Kerr-McGee Industries for recovery of its vanadium content.

Residual phosphorus in furnace dust collected by electrostatic precipitators is oxidized (to oxidize residual phosphorus) and is stored on the ground.

The elemental phosphorus is condensed in a spray tower and transported to storage locations and rail cars under a water seal. The water in direct contact with phosphorus is called "phossy water" and is sent to the hydroclarifier for lime treatment to remove any residual phosphorus. The phossy water surge pond is used for surge capacity when the hydroclarifier is inoperative. The furnaces have a separate water system, called the electrode seal, to prevent furnace gases from escaping at the point where the electrodes enter the furnace. This water is cooled in the seal water pond prior to being recycled. Both the phossy water surge pond and the seal water pond are bentonite lined.

The rotary kiln exhaust gas contains considerable particulate matter. A wet scrubber is used to remove these particulates. The resultant slurry is settled in a hydroclarifier, then dewatered with a filter. The excess water is recycled by the wet scrubber. When the hydroclarifier is down, the solids are dewatered in the underflow solids pond. The dewatered solids are eventually recovered by feeding them back into the kiln.

The underflow solid ponds are now bentonite lined. Previous underflow solid ponds were unlined and have since been abandoned. Closure of these ponds included filling and drainage contouring them with molten slag and capping them with bentonite. A crushed slag layer was then placed on top of the cap to prevent erosion. The hydroclarifier was determined to be leaking and was replaced with a new system which includes a leachate collection system and synthetic liner. The new hydroclarifier also allows for visual determination of leaks.

Coke and quartzite dust resulting from the drier and scrubber were formerly settled out in a slurry pond. This slurry pond is now dry and contains only sediment. At present, the coke and quartzite dust is collected in a baghouse.

## Water Usage

The plant uses a non-contact water cooling system for some of its equipment. The water for this is taken from three production wells and is discharged into Soda Creek via an effluent discharge stream. The temperature and pH of this discharge water is permitted under the National Pollution Discharge Elimination System (E & E 1988). Prior to being discharged, the water passes through a settling pond for particulate removal.

Water usage in close proximity to the site is limited to on-site production wells. Water derived from these wells is used for plant processes including non-contact and contact systems. The closest surface water to the Monsanto facility is Soda Creek, located approximately 2000 feet to the west. Soda Creek is used for irrigation and livestock drinking water.

Down gradient domestic wells were sampled during the Golder and Associates hydrogeological investigation. The only residence to show any contamination (elevated fluoride concentrations) was approximately 1000 feet to the southwest. The residence was immediately supplied with bottled potable water and has since been connected to the Soda Springs city water system.

## **TAT ACTIONS**

TAT conducted an extensive review of EPA and state files and conducted a site visit to determine if the site poses an imminent threat to public health or the environment, and to determine possible removal options. After a review of available file information and a site visit by TAT on October 3, 1989, EPA and TAT determined that additional sampling of facility surface water, groundwater or piled solid waste streams would not be warranted due to the extent of previous sampling efforts. These sampling efforts include a comprehensive groundwater and hydrogeological investigation completed by Monsanto through its contractor Golder and Associates (November 1985), and a site inspection with a limited sampling program (November 2-4, 1987) by the EPA Field Investigation Team (FIT)(E & E 1988) to verify the accuracy of the Golder and Associates sampling data.

The Golder and Associates hydrogeological investigation was conducted to assess the impact of past and current operations on ground and surface water quality. Thirty-one monitoring wells were installed to supplement seven existing wells. Additionally, nearby production and domestic wells were sampled. The results of this investigation are detailed in the November 1985 Golder and Associates report to Monsanto, and are also summarized in the April 1988 FIT report. In brief, groundwater contamination is restricted to the area underlying the facility. Elevated levels (concentrations either ten times background or three times greater than analytical detection limits) of cadmium, selenium, arsenic, manganese, nickel, potassium, vanadium, sodium, zinc, fluoride, sulfate and phosphorus were detected in on-site monitoring wells. Elevated concentration of selenium, vanadium and zinc were detected in an effluent discharge stream.

During the October 3, 1989, visit to the site, TAT toured the facility with EPA and state representatives. The itinerary of the site visit was controlled by the Monsanto representative, Robert Geddes, and was primarily focused on the major processes and process streams outlined in the site background description. All solvent and fuel storage tanks on site are above ground and appeared in good condition. Any below ground tanks were removed by 1986 and were reported to be in good condition at the time of removal. Photos from the site visit are presented in the attachment.

#### CONCLUSION

A site assessment was performed at Monsanto Chemical Company, an elemental phosphorus production plant located in Soda Springs, Idaho, to determine if removal actions are warranted by EPA.

TAT conducted a file review, which included extensive groundwater sampling data, and participated in a site tour on October 3, 1989. From the available information, TAT in conjunction with EPA determined that additional sampling would not be warranted due the extent of previous sampling efforts.

Monsanto is continuing its groundwater monitoring program by sampling on-site monitoring wells biannually. The analytical parameters have not changed since the Golder and Associates hydrogeological investigation. Monsanto has increased the number of on-site monitoring wells to 45. Data collected since the closure of the underflow solids pond and the installation of a new hydroclarifier has shown a decrease in on-site contamination concentrations.

Monsanto periodically tests off-site wells and has documented that no contaminants at these locations currently exceed the Standard Drinking Water Maximum Contaminant Level criteria. Additionally, a new well, upgradient from the site, supplies potable water for the facility. Monsanto's groundwater monitoring program is scheduled to continue, at a minimum, until remediation.

Monsanto is also coordinating a fugitive dust monitoring program with the Idaho State Air Quality Bureau, and at present is in compliance with all federal and state air quality regulations.



#### REFERENCES

Bennett, Dave (U.S. Environmental Protection Agency (EPA)), December 30, 1989, Telephone interview by David Byers (TAT-Project Manager).

Ecology and Environment, Inc. (E & E), April 1988, Site Inspection Report For Monsanto Chemical Company, Soda Springs, Idaho, U.S. EPA Region X TDD file no: F10-8702-06.

Golder and Associates, November 1985, Hydrogeological Investigation, Soda Springs Plant Site, Soda Springs, Idaho.

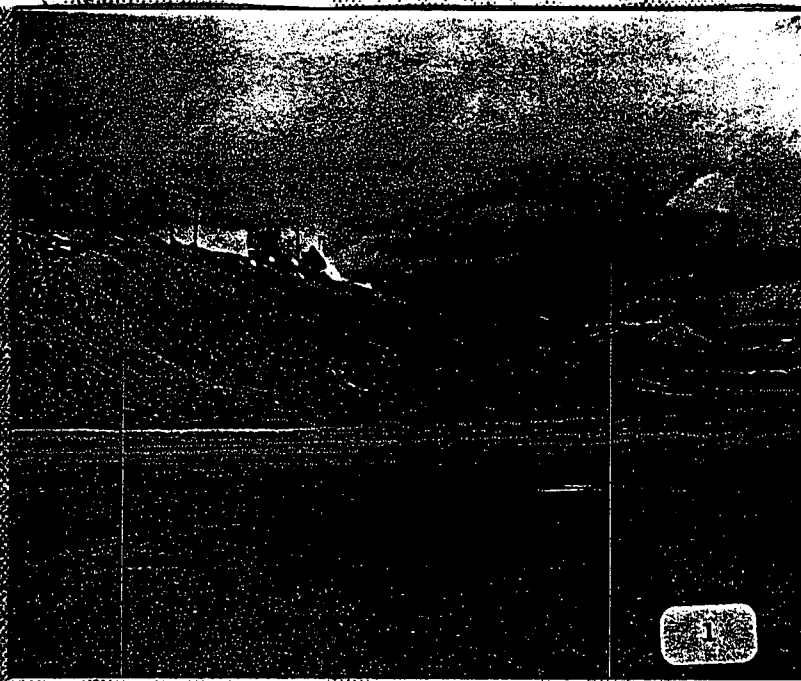
**ATTACHMENT**

Photodocumentation

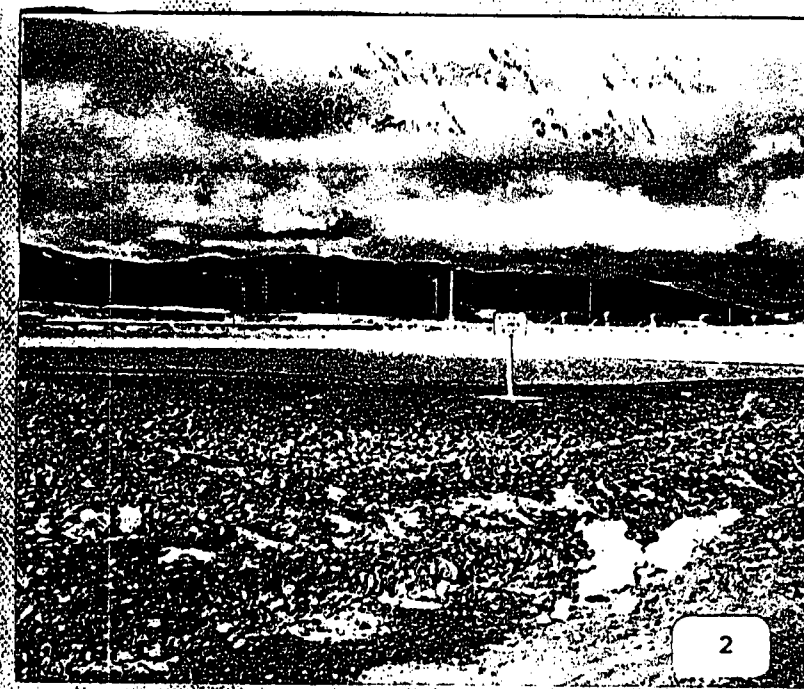
# PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial No.: EPA ID# 186288 TDD No.: T10-8905-009  
Lens Type: 110 mm. Instamatic Site Name: Monsanto Chemical Co.

Photo No.	Date	Taken Time	By	Description
1	10-3-89	1244	J. Roland	Slag pile. Looking southeast.
2	10-3-89	1310	J. Roland	Phossy water pond. Looking northwest.
3	10-3-89	1317	J. Roland	Site landfill. Looking northwest.
4	10-3-89	1344	J. Roland	Retaining ponds. Looking west.



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